REMARKS

Claims 1, 3-10, 12-17, 19-20, 34, 39, and 41-42 were presented for examination in the present application. The instant amendment cancels claim 42 and adds new claims 43-44. Thus, claims 1, 3-10, 12-17, 19-20, 34, 39, 41, and 43-44 are pending for consideration upon entry of the instant amendment. Claim 1 is independent.

Independent claim 1, as well as dependent claims 3-7, 9-10, 12-17, 19-20, 34, 39, and 41-32 were rejected under 35 U.S.C. §103 over U.S. Publication No. 2002/0019069 to Wada et al. (Wada) in view of U.S. Patent No. 4,374,391 to Camlibel et al. (Camlibel), U.S. Patent No. 5,047,369 to Fleming et al (Fleming), U.S. Patent No. 4,001,049 to Baglin (Baglin), and U.S. Patent No. 4,855,026 to Sioshansi (Sioshansi). Dependent claim 8 was rejected under 35 U.S.C. §103 over the proposed combination of Wada, Camlibel, Fleming, Baglin, and Sioshansi in further view of U.S. Patent No. 4,889,960 to Butt (Butt). Dependent claim 34 was rejected under 35 U.S.C. §103 over the proposed combination of Wada, Camlibel, Fleming, Baglin, and Sioshansi in further view of U.S. Patent No. 6,111,270 to Xu et al. (Xu).

Independent claim 1 has been amended to remove various elements deemed un-necessary for patentability. The amended claims are intended to no longer be limited to the specific mechanisms of patentability previously argued with respect thereto. Applicants therefore rescind any previous disclaimer of claim scope and, thus, any prior art, for which such a disclaimer was made to avoid, may need to be revisited by the Examiner with respect to the amended claims.

Applicants respectfully submit that the proposed combination of cited art fails to disclose or suggest claim 1.

Independent claim 1 recites the steps of "producing an ion beam by ionizing a gas in a plasma generated by the plasma source" and "directing the ion beam onto the substrate during the vapor-coating so as to additionally densify the glass layer".

The Office Action acknowledges that Wada fails to disclose vapor depositing a glass layer. Rather, Wada merely discloses a method that includes adhering an optical glass or an optical glass chip to a semiconductor chip by an adhesive such as a transparent resin or a low melting point glass or the like.

Camlible discloses a fabrication technique for making various devices in which a type of glass is used as a surface protection layer. The glass layers are put down by particle bombardment (generally sputtering) of a borosilicate glass target. Deposition of the film may be carried out in a variety of ways all of which involves bombardment of the glass target with various kind of particles. Typical deposition procedures are sputtering and the E-beam deposition. See col. 4, lines 44 to 48.

Fleming is directed to a process of producing semiconductor devices which involves deposition of protective glass layers by a particle beam technique from targets of phosphosilicate glass (PSG), as well as a process for production of such targets. The PSG is deposited on the semiconductor by a particle-beam deposition including e-beam deposition and sputtering.

Butt is merely asserted as disclosing organic-reinforced glass, while Xu is merely asserted as disclosing stacks of layers.

However, Applicants respectfully submit that none of the above described documents (Camlible, Fleming, Butt or Xu) disclose or suggest the method steps of producing of an ion beam by ionizing a gas in a plasma generated by a plasma source and directing this ion beam onto a substrate during a vapor deposition as recited by claim 1.

Rather, the Office Action asserts that it would have been obvious to further modify the combination of Wada, Camlible, and Fleming in view of Baglin and Sioshansi to include producing an ion beam by ionizing a gas in a plasma and directing this ion

beam onto the substrate during the vapor coating. See page 3 of the Office Action dated March 17, 2008.

Applicants respectfully traverse this assertion.

More specifically, Applicants respectfully submit that both Baglin and Sioshani are directed to methods of implanting ions in a deposited layer and, not, "directing an ion beam onto the substrate during the vapor-coating so as to additionally densify the glass layer" as in claim 1.

In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). See also In re Deminski, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); In re Clay, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992) ("A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem."); Wang Laboratories Inc. v. Toshiba Corp., 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993).

Sioshani shows a sputter enhanced ion implantation process that uses an ion beam implanter together with an electron beam evaporation system. Sioshani does not show a deposited glass layer. Sioshani provides no hint to the packaging or housing of electronic modules. Sioshani relates essentially to the deposition of metallic hard coatings on workpieces such as ball bearings, industrial gears and toolings, and orthopaedic surgical implants. Applicants submit that ion implantation via an ion implanter as in Sioshani is simply not reasonably related to the step of "directing an ion beam onto the substrate during the vapor-coating so as to additionally densify the glass layer" as claimed. Therefore, Applicants submit that Sioshani is non-analogous prior art to the present application.

Baglin discloses an ion radiation treatment of amorphous SiO_2 thin film with a subsequent annealing procedure. The implanted ions are provided by an ion accelerator. See Figure 1 and the corresponding description. Applicants submit that ion implantation via an ion accelerator as in Baglin is simply not reasonably related to the step of "directing an ion beam onto the substrate during the vapor-coating so as to additionally densify the glass layer" as claimed. Therefore, Applicants submit that Baglin is also non-analogous prior art to the present application.

In sum, Applicants submit that Baglin and Sioshani should be considered non-analogous art to the present application.

Nonetheless, assuming that Baglin and Sioshani to be analogous art to the present application (which they are not), Applicants submit that the proposed combination of cited art, even in view of Baglin and Sioshani, fails to disclose or suggest claim 1.

Sioshani discloses an ion implanter, while Baglin discloses an ion accelerator. Applicants submit that the implanted ions described in Baglin and Sioshani are initially generated by an ion source (a plasma source) but are subsequently accelerated, guided and/or filtered (in energy and/or mass) into the substrate.

In contrast, claim 1 recites "producing an ion beam by ionizing a gas in a plasma generated by the plasma source" and "directing the ion beam onto the substrate during the vapor-coating so as to additionally densify the glass layer". Thus, the claimed vapor-coating of the substrate with a glass layer encompasses a plasma ion assisted deposition (PIAD).

In this case, an ion beam is additionally directed onto the substrate to be coated. The ion beam is provided by a plasma source, for example by the ionization of a suitable gas in the evaporation chamber. Accordingly, the PIAD according to the

invention is based on the simultaneous deposition and densification in the "same" chamber. The ions used in PIAD are directly extracted or drawn from a plasma source.

Accordingly, Applicants submit that the proposed combination of cited art simply fails to disclose or suggest the method recited by claim 1.

In order to make explicit that which was implicit in the claim, claim 1 has been amended to recite the step of "providing a vapor-deposition glass source and a plasma source in one arrangement (emphasis added)".

Applicants submit that Baglin and Sioshani, alone or in combination with the cited art, fail to disclose or suggest "providing a vapor-deposition glass source and a plasma source in one arrangement" followed by "producing an ion beam by ionizing a gas in a plasma generated by the plasma source", and "directing the ion beam onto the substrate during the vapor-coating so as to additionally densify the glass layer" as in claim 1.

Accordingly, claim 1 is in condition for allowance. Claims 3-10, 12-17, 19-20, 34, 39, and 43-44 are also in condition for allowance for at least the reason that they depend from claim 1. Reconsideration and withdrawal of the rejection to claims 1, 3-10, 12-17, 19-20, 34, and 39 are therefore respectfully requested.

Furthermore, claim 12 is believed to be in condition for allowance.

Claim 12 recites that "the glass target is a borosilicate glass comprising aluminum oxide and alkali metal oxide fractions (emphasis added)".

The Office Action asserts that Wada as modified by Camlibel does not limit the borosilicate glass to any particular type, therefore the combined disclosure encompasses all well-known borosilicate glass. See page 5 of the Office Action dated March 17, 2008.

Applicants respectfully traverse this assertion. Camlibel discloses that its invention in its broadest terms is the use of sputtered borosilicate glass layers on the surface of materials used in various articles and devices. The borosilicate glass target material used in the sputtering procedure is prepared in a special way to ensure a uniform mix of SiO_2 and B_2O_3. See col. 3, lines 30-40.

Thus, Applicants submit that Camlibel does not "encompasses all well-known borosilicate glass" as a target source as was asserted by the Office Action. Rather, Camlibel discloses a specific target material that is prepared in a special way.

Moreover, and even if one were to assume that (contrary to the explicit disclosure of Camlibel) the proposed combination of Wada and Camlibel provided a disclosure that encompasses all well-known borosilicate glass, Applicants submit that the proposed combination fails to explicitly disclose or suggest the claimed glass target.

Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range. "The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims." In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

The present application provides that: "The preferred vapor-deposition glass is a borosilicate glass containing aluminum oxide and alkali metal oxide fractions, such as for example the vapor-deposition glass of type 8329 produced by Schott Glas. Moreover, this glass has a coefficient of thermal expansion which is close to that of the substrate for standard semiconductor structures or can be matched to the coefficient of thermal expansion of the substrate by suitable modification to the components." See page 4, lines 15-27.

Applicants submit that there is simply no suggestion that the proposed combination of cited art discloses or suggests the criticality of the combination of aluminum oxide and alkali metal oxide fractions as in claim 12, which provides a coefficient of thermal expansion which is close to that of the substrate for standard semiconductor structures.

Accordingly, claim 12 is in condition for allowance. Reconsideration and withdrawal of the rejection to claim 12 are therefore respectfully requested.

Claims 43 and 44 have been added to point out various aspects of the present application. Support for new claims 43 and 44 can be found in the present application at least at pages 11 and 12. No new matter is added.

Claims 43 and 44 are believed to be in condition for allowance for at least the reason that they depend from the aforementioned claim 1. In addition, claim 43 recites that the glass layer has a composition, in percent by weight, comprising: SiO_2 75 to 85; B_2O_3 10 to 15; Na_2O 1 to 5; Li_2O 0.1 to 1; K_2O 0.1 to 1; and Al_2O_3 1 to 5. Claim 44 recites that the glass layer has a composition, in percent by weight, comprising: SiO_2 65 to 75; B_2O_3 20 to 30; Na_2O 0.1 to 1; Li_2O 0.1 to 1; K_2O 0.5 to 5; and Al_2O_3 0.5 to 5. Applicants respectfully submit that the proposed combination of cited art fails to disclose or suggest a method that results in a glass layer having the compositions recited by claims 43 and 44.

In view of the above, it is respectfully submitted that the present application is in condition for allowance. Such action is solicited.

If for any reason the Examiner feels that consultation with Applicants' attorney would be helpful in the advancement of the prosecution, the Examiner is invited to call the telephone number below.

Respectfully submitted,

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